It remains to be seen whether in all cases cooling to very low temperatures destroys the power of these radicles to bestow high dielectric values on compounds containing them when at temperatures near or above their melting points.

In conclusion, we have again to thank Mr. Petavel for valuable help in taking the above described observations, and reducing the results.

Note added June 1.

In their paper "On Capacity and Residual Charge of Dielectrics as affected by Temperature and Time,"* Dr. J. Hopkinson and Mr. Wilson give measurements of the dielectric constant of glycerine for high and low frequencies at ordinary temperatures. The value they obtain is 60 for high frequency and 50 to 60 for low frequency. They also say that glycerine has no residual charge. We obtain an almost identical value for a frequency of 120 at −50°, but below that temperature the dielectric curve of glycerine, we find, runs almost parallel to that of ice. It is difficult to understand why residual charge (which in ice, the above-named authors say, is considerable) should be the cause of high dielectric value at ordinary temperatures in the case of one substance and not in the case of the other.

"The Sensitiveness of the Retina to Light and Colour." By Captain W. DE W. ABNEY, C.B., D.C.L., F.R.S. Received May 10,—Read June 3, 1897.

(Abstract.)

The author treats first of the extinction of the sensation of light on the centre of the retina. He made his reduction of the intensity of the light falling on the illuminated spot with a new piece of apparatus, which consisted of a gelatine wedge bent so as to make an annulus. He describes this wedge and its graduation, showing how its readings can be utilised, they being proportional to the logarithm of the intensity of light passing through it.

It is found that the smaller the spot of illuminated surface the less reduction in intensity of the light is required, and that the amount of reduction of the light falling on the spot which just produces no sensation of light is connected with the size of the spot by a simple formula, $I = x^m$, where I is the intensity and x the diameter of the spot. Further, he finds that it is the smallest diameter which governs the necessary reduction in intensity and not the area of the

* 'Phil. Trans.,' A, vol. 189, 1897, p. 134.

illuminated surface. Having experimented with the extinction of light at other parts of the retina, he finds that it obeys the same law. Since a large and a small area having the same actual illumination appear to be of different brightness, an investigation was made of the relative luminosities of the two, and it was found that the two were connected by a very simple law.

The reduction of the intensity of a coloured ray to extinguish all colour was next measured with areas of different dimensions, and it was shown that again the intensity of the reduced light was connected with the size of the spot by a simple expression similar to that of the extinction of all light, but the exponential coefficient differed, indicating that light and colour were not connected together in the manner which might be expected.

The author then deals with the question of colour fields, and finds that all colour fields are of the same form, the extent depending solely on the illumination and the area of the surface the image of which falls on the retina. He finds that there is a connection between the intensity of the colour and the extent of the field which can be expressed by a formula, as also can the connection between the size of the spot of illuminated surface and the extent of field. He gives the curves of illumination for equal colour fields, and the curves of extent of field for every colour in the prismatic spectrum. Finally he makes an investigation into the relative sensitiveness to light of various points in the retina, and shows that there are "iso-lumes" or fields of equal sensitiveness which appear to be of the same form as the colour fields.

He points out that there are difficulties in reconciling these results with either the Young or Hering theory of colour vision, and suggests a modification in the accepted theory of light and colour which may explain the connection between the two.

"On the Mechanism by which the First Sound of the Heart is Produced." By Sir RICHARD QUAIN, Bart., M.D., F.R.S.

Received April 29,—Read June 3, 1897.

It is a well-recognised fact that the action of the heart is accompanied by the emission of certain sounds, which are described as the first and second sounds of the heart. These sounds, which were observed soon after Laennec had discovered the use of the stethoscope, have been compared to the sounds produced by the utterance of the words lŭbb-dŭp. They have been studied with interest by the physicist, the biologist, the pathologist, and the clinical physician, by the latter especially, inasmuch as the changes produced by disease in the character of these sounds become of material assistance in the